

NON-PUBLIC?: N
ACCESSION #: 9006190024
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Wolf Creek Generating Station PAGE: 1 OF 03

DOCKET NUMBER: 05000482

TITLE: Reactor Trip Signal and Engineered Safety Features Actuations
During Turbine Overspeed Testing Caused By Difficulty in Steam
Generator Level Control

EVENT DATE: 05/14/90 LER #: 90-011-00 REPORT DATE: 06/13/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 8

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Merlin G. Williams TELEPHONE: (316) 364-8831
Manager Plant Support

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On May 14, 1990, at 2136 CDT, during performance of the Main Turbine overspeed trip test, a Feedwater Isolation Signal (FWIS) and Main Turbine trip signal occurred when Steam Generator 'B' reached the high-high level setpoint. Shortly thereafter, a Reactor trip and Auxiliary Feedwater Actuation Signal (AFAS), and Steam Generator Blowdown and sample Isolation Signal (SGBSIS) occurred when Steam Generator 'C' reached the low-low level setpoint. All Engineered Safety Features and Reactor Protection System equipment responded properly to the actuation signals.

Earlier in the day on May 14, 1990, feedwater preheating using main steam had been removed from service. When the Main Turbine was taken offline in accordance with the overspeed trip test, feedwater heating using extraction steam was lost. As a result of the colder feedwater being

supplied to the steam generators, significant level oscillations occurred. Although the Control Room Operators took the appropriate actions to dampen these oscillations, their efforts were unsuccessful in preventing the high-high and low-low level conditions.

The procedure for performing the overspeed trip test has been revised to require feedwater heating to be inservice prior to conducting the test. The revised test was completed successfully on May 16, 1990 at 0002 CDT.

END OF ABSTRACT

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INTRODUCTION

On May 14, 1990, at 2136 CDT, during the performance of the Main Turbine TA-TRB! overspeed trip test, a Feedwater Isolation Signal (FWIS) and Main Turbine trip signal occurred when Steam Generator 'B' AB-SG! reached the high-high level setpoint of 78 percent. Shortly thereafter, a Reactor trip Auxiliary Feedwater Actuation Signal (AFAS) and Steam Generator Blowdown and Sample Isolation Signal (SGBSIS) occurred when Steam Generator 'C' reached the low-low level setpoint of 23.5 percent. All Engineered Safety Features (ESF) and Reactor Protection System (RPS) equipment responded properly to the actuation signals. These events are being reported pursuant to 10 CFR 50.73(a)(2)(iv) concerning unplanned actuations of ESF and RPS equipment.

DESCRIPTION OF EVENT

Prior to these events, the unit was operating in Mode 1, Power Operations, at 18 percent reactor power. The main Generator TA-GEN! was synchronized to the grid with a load of approximately 128 Megawatts electrical. Steam Generator levels were being controlled by the Main Feedwater Control Valve Bypass Valves SJ-V!, which were in automatic. Surveillance testing was being conducted in accordance with surveillance procedure STN AC-007, "Turbine Overspeed Trip Test".

At 2043 CDT, the steam dumps placed in the steam pressure mode to maintain reactor power at approximately 8 percent while the testing was in progress. Per the instructions in the surveillance test procedure, Main Turbine load was reduced to approximately 47 Megawatts electrical and the Main Generator output breakers were opened at 2123 CDT. Following the trip of the Main Turbine, feedflow/steamflow mismatches and steam generator level oscillations occurred in all steam generators. The Control Room operators took manual control of the steam dumps and the Main Feedwater Control Valve Bypass Valves in an effort to dampen the

oscillations. However, these efforts were unsuccessful in preventing level in Steam Generator 'B' from reaching the high-high level setpoint of 78 percent, initiating a Main Turbine trip signal and a FWIS at 2136 CDT. The steam generator level oscillations continued, and at 2137 CDT, water level in Steam Generator 'C' reached the low-low level setpoint of 23.5 percent, and initiated a Reactor trip signal, AFAS, and SGBSIS. All ESF and RPS equipment responded properly to these signals.

After verification that all equipment had functioned properly, the motor-driven Startup Main Feedwater Pump SJ-P! was started and the Auxiliary Feedwater Pumps BA-P! were secured at 0016 CDT on May 15, 1990. A reactor restart began at 0445 CDT.

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ROOT CAUSE AND CORRECTIVE ACTION

Review of this event concluded that the severe steam generator water level oscillations prior to the FWIS were a direct result of low feedwater temperature. Previous operating experience has demonstrated that difficulty in steam generator level control while at low power levels is minimized by the use of preheated feedwater. Earlier in the day on May 14, feedwater preheating using Main Steam had been secured when turbine-driven Main Feedwater Pump 'A' SJ-P! was placed in service and the motor driven Startup Feedwater Pump SJ-P! was secured. When the Main Turbine Generator was taken offline at 2123 CDT, feedwater heating using extraction steam was removed, and feedwater temperature rapidly decreased from approximately 400 degrees Fahrenheit to approximately 150 degrees Fahrenheit. The colder feedwater contributed significantly to the effects of "shrink" and "swell" in steam generator water level. The Control Room Operators took the appropriate actions to compensate for these effects, but their efforts were unsuccessful. In order to prevent recurrence of this type of event, a procedure revision to STN AC-007 was issued on May 15, 1990, to add a requirement to ensure feedwater heating is in service as an initial condition to perform turbine overspeed trip tests. The turbine overspeed trip test was completed satisfactorily on May 16, 1990, at 0002 CDT, with feedwater heating inservice.

ADDITIONAL INFORMATION

All safety systems functioned as designed during this transient, thus preventing development of conditions that could have posed a threat to the health and safety of the public.

Licensee Event Reports 90-007-00, 85-064-00 and 85-042-00 discuss previous ESF equipment actuations in which the absence of feedwater

preheating was a major causal factor. As discussed in Licensee Event Reports 85-064-00 and 85-042-00, the procedure for performing a plant startup contains instructions for maximizing feedwater temperature during a plant startup. During the revisions to this procedure, the need to also revise STN AC-007 was not foreseen.

ATTACHMENT 1 TO 9006190024 PAGE 1 OF 1

WOLF CREEK
NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

June 13, 1990

WM 90-0107

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 90-011-00

Gentlemen:

The attached Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73 (a) (2) (iv) concerning an Engineered Safety Features Actuation.

Very truly yours,

Bart D. Withers
President and
Chief Executive Officer

BDW/aem

Attachment

cc: R. D. Martin (NRC), w/a
D. V. Pickett (NRC), w/a
M. E. Skow (NRC), w/a
J. S. Wiebe (NRC), w/a

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